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Multi-Ratio Chain Sprocket

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MULTI-RATIO CHAIN SPROCKET

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Abstract

The Multi-Ratio Chain Sprocket is a positive power transmission device designed to permit variable ratios on a single-chain sprocket, and to allow ratio changes while the sprocket is loaded. Six cams form the circumferences of the sprocket. These cams can be moved in or out while they are in the disengaged phase of the cycle and as they move they index to maintain a high percentage of teeth engagement. This movement changes the diameter of the sprocket, thus changing its ratio. A full scale prototype has been manufactured and tested. The design and the materials used permit the sprocket to withstand loads equal to those which RC 25 chain can withstand, and give the sprocket a life of approximately 30,000 hours, comparable to that of a single-speed sprocket. Testing validated this design for providing multiple ratios on a single sprocket, but the prototype must be developed further to provide the full capabilities desired.

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